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| **Lesson Title:** Heredity Match Activity |
| **Subject area / course / grade level:** 7th grade, Life science |
| **Introduction:** Lesson can be an introduction into Meiosis and Punnett squares, but I normally use it for additional exploration and practice. |
| **Lesson Length:** 1 class (45 mins) |
| **Materials:**  Pencil / paper  Whiteboard / markers / eraser  Some small handheld items (beads, blocks, place markers, etc.) in 2 common colors (white and red for example) with enough for each student to have 1 of each color. |
| **Lesson Overview:**  Students will perform an activity to see pairing of genes showing how the genotype of parents can pass to offspring, including dominant or recessive traits. |
| **Tennessee Standards:**  SPI 0707.4.3 – Describe the relationship among genes, chromosomes, and inherited traits.  SPI 0707.4.4 – Interpret a Punnett square to predict possible genetic combinations passed from parents to offspring during sexual reproduction. |
| **Lesson objective(s):**  To identify the passing of traits from parent to offspring during sexual reproduction through a Punnett square activity. |
| **ENGAGEMENT**  I start with telling the students that they will be reproducing a hypothesized plant with other plant owners (students) in the room. They all begin with the same genotype and phenotype. I have students thinking about possible outcomes and the likelihood of each. |
| **EXPLORATION**  Each student is given 2 “alleles” (a red bead and white bead, or some other small object). They have to go around to others in the room and reproduce their plant with the plants of other students. Each time they reproduce, they students are each holding their different alleles in a hand (red in one, white in another) where their new partner cannot see them. Each partner picks a hand for their mate to reveal which combination of traits they have passed on to their offspring. Each student must have 10 matches and record their results (I let them write them on the board.)  We will analyze the data later. |
| **EXPLANATION**  Students need to be able to explain their outcome for each matching partner including the offspring’s genotype, its physical appearance (phenotype), etc. Then they need to be able to see what all possibilities could have happened (Punnett square). We then analyze the group data to see if our results were similar to the expected outcomes. |
| **ELABORATION**  Students can elaborate by hypothesizing what might happen if some of them were homozygous dominant (RR) or totally recessive (rr) instead of heterozygous (Rr). Or the activity can be replicated by following a set of offspring through generations by breaking the class into 2 main groups, starting with 2 parent organisms and giving the beads off to a new person with the new genotype and following the patterns through a pedigree.  Vocabulary – heredity, chromosome, gene, allele, dominant trait, recessive trait, genotype, phenotype  Daily application goes into why we are different from our parents though we have many of their traits. What makes us more like one in some ways, or like the other in different areas. |
| **EVALUATION**  No major evaluations here. Observation of the activity and student answers to teacher questions. A writing activity can be used after the lesson to answer critical thinking questions such as “why were our results different from the Punnett square?” or “what would happen if this person had a different phenotype?” |